DAMES & MOORE A PROFESSIONAL LIMITED PARTNERSHIP
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March 6, 1988

Our Ref: 16934-001-19

Mr. Jamie Sturgess
Cyprus Minerals, Inc.
7200 South Alton Way
Englewood, Colorado 80155

Dear Mr. Sturgess:

As discussed during our conversation on March 3, 1988, you requested that Dames & Moore review and compare NPDES daily maximum discharge limitations and instream water quality standards for the Thompson Creek molybdenum mining operation in Idaho with limitations and standards of other molybdenum mining operations in New Mexico and Colorado. Accordingly, Dames & Moore reviewed the EPA National Water Quality Standards and relevant NPDES permits and their coinciding rationale documents to perform this task.

All molybdenum mining operations reported by Dames & Moore discharged water from mills or tailings impoundments into cold water aquatic life streams. Dames & Moore has reviewed relevant permit information for the following mines:

Thompson Creek Mine, Idaho
Questa Mine, New Mexico
Keystone Mine - Mt. Emmons Moly Project, Colorado
Henderson Mine, Colorado
Climax Mine, Colorado

Dames & Moore has prepared two summary tables, one comparing the daily maximum discharge limitations and another comparing water quality standards between those limitations and standards proposed at the Thompson Creek molybdenum mine with other molybdenum mines in New Mexico and Colorado that discharge treated water into cold water aquatic life streams.

Included herein are Table 1, Daily Maximum Effluent Discharge Limitations, and Table 2, Applicable Instream Water Standards, along with the appropriate supporting documentation.

The following are our observations based on the results of the comparison of discharge limitations and water quality standards between the Thompson Creek molybdenum mine and other similar molybdenum mines in the western United States.

Although instream standards on receiving waters for some of the other mines were lower (e.g., As for Molycorp-Questa, AMAX-Climax, and AMAX-Mt. Emmons; Zn for AMAX-Henderson), effluent limitations are more stringent for Cyprus-Thompson Creek in all but one case. In fact, sometimes by 2 to 3 orders of magnitude. Furthermore, the use of only 25 percent of the receiving water flow for dilution of Cyprus-Thompson Creek effluent is more stringent than for the other mines, which were uniformly allowed 100 percent of the 7Q10 streamflow.

Please note that Colorado is currently promulgating new water quality standards for cold water fisheries and the effect on specific stream segments which are receiving waters for the mines investigated herein are not known.

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If you have any questions or comments regarding the above, please do not hesitate to contact us.

Sincerely,

DAMES & MOORE

David H. Warren
Senior Program Manager

Linda C. Rock
Regulatory Affairs Analyst

Attachments

LCR/DHW:mgm

TABLE 1
DAILY MAXIMUM EFFLUENT DISCHARGE LIMITATIONS

	Cyprus Minerals, Inc. Thompson Creek Mine Idaho	Molycorp, Inc. Questa Mine New Mexico		AMAX, Inc. Keystone Mine - Mt. Emmons Moly Project Colorado
Existing NPDES Permit Parameters and Limitations		Outfall #001: Process water from milling operations and tailings disposal into Rio Grande. Outfall #002: Seepage from tailings impoundment into Red River.		Outfall #001: Treatment plant wastewater prior to entering Coal Creek.
Total As		**1.0 mg/l**		---
Total Cd		**0.05 mg/l**		---
Total Cu		**0.30 mg/l**		**0.04 mg/l**
Total Hg		**0.002 mg/l**		**0.00005 mg/l**
Total Pb		**0.6 mg/l**		**0.15 mg/l**
Total Zn		**0.2 mg/l**		**0.6 mg/l**
Proposed NPDES Permit Parameters and Limitations	Outfall #001: Treated mine runoff discharged from sediment pond into Buckskin Creek. Outfall #002: Treated mine runoff discharged from sediment pond into Pathughes Creek.	During mill shutdown periods for Outfall #002	During mill operations for Outfalls #001 and #002	
Total As	**0.49 mg/l**	**1.0 mg/l**	**1.0 mg/l**	
Total Cd	**0.0053 mg/l**	**0.05 mg/l**	**0.05 mg/l**	
Total Cu	**0.0245 mg/l**	**0.30 mg/l**	**0.30 mg/l**	
Total Hg	ND[a]	**0.002 mg/l**	**0.002 mg/l**	
Total Pb	**0.0150 mg/l**	**0.2 mg/l**	**0.6 mg/l**	
Total Zn	**0.163 mg/l**	**0.2 mg/l**	**0.2 mg/l**	

[a]ND = nondetectable.

TABLE 1
DAILY MAXIMUM EFFLUENT DISCHARGE LIMITATIONS

Seasonal Differences

	AMAX, Inc. Climax Mine Colorado	
Proposed[b] NPDES Permit Parameters and Limitations	Outfall #001: Outfall from Parshall flume (all-season limitations).	Outfall #001: Outfall from Parshall flume (60-day snowmelt bypass limitations 05/1 - 07/31).
Total As	—	—
Total Cd	**0.024 mg/l**	**0.028 mg/l**
Total Cu	**0.088 mg/l**	**0.266 mg/l**
Total Hg	—	—
Total Pb	**0.008 mg/l**	**0.036 mg/l**
Total Zn	**0.34 mg/l**	**1.04 mg/l**

[b]Existing permit was not available from the Colorado Department of Health on 3/3/88.

TABLE 1
DAILY MAXIMUM EFFLUENT DISCHARGE LIMITATIONS

Seasonal Differences

AMAX, Inc.
Henderson Mine
Colorado

Existing NPDES Permit Parameters and Limitations	Outfall #001: Outfall from final settling pond into transport pipeline to lower Urad Reservoir.				Outfall #004: Storm bypass from mill side tailings pond system into Woods Creek.
	05/1 - 07/31	08/1 - 10/31	11/1 - 01/31	02/1 to 04/30	05/1 - 07/31
Total As	—	—	—	—	—
Total Cd	0.06 mg/l	0.06 mg/l	0.04 mg/l	0.04 mg/l	0.10 mg/l
Total Cu	0.10 mg/l	0.12 mg/l	0.08 mg/l	0.06 mg/l	0.30 mg/l
Total Hg	—	—	—	—	0.002 mg/l
Total Pb	0.12 mg/l	0.12 mg/l	0.08 mg/l	0.06 mg/l	0.60 mg/l
Total Zn	1.5 mg/l	1.5 mg/l	1.5 mg/l	1.5 mg/l	1.0 mg/l

TABLE 2
APPLICABLE INSTREAM WATER QUALITY STANDARDS

	Cyprus Minerals, Inc. Thompson Creek Mine Idaho[a]		Molycorp, Inc. Questa Mine New Mexico	AMAX, Inc. Keystone Mine - Mt. Emmons Moly Project, Colorado	AMAX, Inc. Henderson Mine Colorado		
Applicable Instream Water Quality Standards	Outfall #001: Treated mine runoff discharged from sediment pond into Buckskin Creek. Outfall #002: Treated mine runoff discharged from sediment pond into Pathughes Creek.		Outfall #002: Seepage from tailings impoundment into Red River.	Outfall #001: Treatment plant wastewater prior to entering Coal Creek.	Outfall #001: Outfall from final settling pond into transport pipeline to lower Urad Reservoir.	Outfall #004: Storm bypass from mill side tailings pond system into Woods Creek.	
	Acute	Chronic				Daily Maximum (acute)	30-day Average (chronic)
Total As	0.36 mg/l	0.19 mg/l	0.05 mg/l	0.05 mg/l	—	—	—
Total Cd	0.0039 mg/l	0.0011 mg/l	0.010 mg/l	0.01 mg/l	0.002 mg/l	0.0008 mg/l	0.0004 mg/l
Total Cu	0.018 mg/l	0.012 mg/l	—	0.01 mg/l	—	0.01 mg/l	0.005 mg/l
Total Hg	0.0024 mg/l	0.000012 mg/l	0.002 mg/l	0.00005 mg/l	—	0.00010 mg/l	0.00005 mg/l
Total Pb	0.082 mg/l	0.0032 mg/l	0.05 mg/l	0.025 mg/l	—	0.008 mg/l	0.004 mg/l
Total Zn	0.120 mg/l	0.110 mg/l	—	1.08 mg/l	0.10 mg/l	0.10 mg/l	0.05 mg/l

[a]100 mg/l hardness.

TABLE 2
APPLICABLE INSTREAM WATER QUALITY STANDARDS

AMAX, Inc.
Climax Mine
Colorado

Applicable Instream Water Quality Standards	Receiving Stream Segment		Downstream Segment	
	All Season	Snowmelt Bypass	All Season	Snowmelt Bypass
Total As	0.05 mg/l	—	0.05 mg/l	—
Total Cd	0.012 mg/l	0.014 mg/l	0.0057 mg/l	0.008 mg/l
Total Cu	0.044 mg/l	0.133 mg/l	0.005 mg/l	0.03 mg/l
Total Pb	0.004 mg/l	0.018 mg/l	0.004 mg/l	—
Total Hg	0.00005 mg/l	—	0.00005 mg/l	—
Total Zn	0.169 mg/l	0.52 mg/l	0.175 mg/l	0.31 mg/l